REMARKS

Claims 1 – 18 and 20 have been examined. Claim 1 stands rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Pat. No. 6,705,124 ("Zhong") in view of U.S. Pat. No. 6,204,200 ("Shieh"); Claims 1 – 7, 13 – 15, 18, and 20 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Pat. No. 6,154,582 ("Bazylenko") in view of U.S. Pat. No. 5,136,671 ("Dragone"), Shieh, and optionally in view of Zhong and U.S. Pat. No. 5,872,058 ("Van Cleemput") or U.S. Pat. No. 5,913,140 ("Roche"); Claim 8 stands rejected under 35 U.S.C. §103(a) as unpatentable over Bazylenko in view of Dragone, Shieh, and optionally in view of Zhong and Van Cleemput or Roche, and further in view of U.S. Pat. No. 6,451,686 ("Ngai"); Claims 9 – 11 stand rejected under 35 U.S.C. §103(a) as unpatentable over Bazylenko in view of Dragone, Shieh, and optionally in view of Zhong and Van Cleemput or Roche, and further in view of U.S. Pat. No. 4,856,859 ("Imoto"); Claim 12 stands rejected under 35 U.S.C. §103(a) as unpatentable over Bazylenko in view of Dragone, Shieh, and optionally in view of Zhong and Van Cleemput or Roche and Imoto, and further in view of U.S. Pat. No. 4,557,561 ("Schneider"); Claim 16 stands rejected under 35 U.S.C. §103(a) as unpatentable over Bazylenko in view of Dragone, Shieh, and optionally in view of Zhong and Van Cleemput or Roche, and further in view of U.S. Pat. No. 6,194,038 ("Rossman"); Claim 17 stands rejected under 35 U.S.C. §103(a) as unpatentable over Bazylenko in view of Dragone, Shieh, and optionally in view of Zhong and Van Cleemput or Roche, and further in view of Rossman and U.S. Pat. No. 6,122,934 ("Narita").

Independent Claim 1 has been amended to incorporate limitations previously recited in Claims 2 and 7, and various amendments have been made to the dependent claims for consistency with such amendments. In making such amendments, it has been clarified that the high-density plasma is generated inductively (*see* Application, p. 8, l. 11) and that it has an ion density of at least 10^{11} ions/cm^3 (*id.*, Col. 4, ll. 20 – 21). The combination of limitations now recited in Claim 1 embraces the use of HDP-CVD with simultaneous deposition and sputtering components to provide a deposition-sputter ratio between 3:1 and 10:1 in depositing a fluorine-doped silicate glass layer over a plurality of seporated optical cores to act as an uppercladding layer.

The rejection of Claim 1 over Zhong and Shieh is moot in light of the amendments. Applicant notes, however, that the recited limitations define a combination having

criticality by avoiding the need to anneal the deposited uppercladding layer while at the same time achieving the desired refractive index by scavenging hydrogen from silane precursors (*see* Application, p. 6, ll. 10 – 29). Zhong notes the converse requirement that an anneal process be performed on the cladding layer after the HDP deposition (Zhong, Abstract).

The following comments are offered in connection with the other basis for rejection of Claim 1 in the interest of advancing prosecution of the application. Applicants have previously noted that Bazylenko does not disclose a plurality of optical cores that define a sequence of gaps having the recited physical structure. In addition, Applicants have challenged the assertion that there would be a motivation to modify Bazylenko to provide multiple cores by noting that there is no basis for desiring more light-communication pathways and, in any event, no clear way to modify the structure of Bazylenko to achieve that goal. The current Office Action responds by noting that Bazylenko discloses that its method "has advantageous application for the fabrication of any optical device" (Office Action, p. 11, *citing* Bazylenko, Col. 3, ll. 9 – 10). Applicant has no particular quarrel with the view that Bazylenko's method may be used with other optical devices because Bazylenko goes on to explain that it is referring to "[t]he advantage of PECVD, and in particular the advantage of excluding nitrogen from the process" (Bazylenko, Col. 3, ll. 11 – 13).

Applicant does disagree, however, with the assertion that Bazylenko discloses use of a plasma deposition process that has simultaneous deposition and sputtering components. Bazylenko discloses only PECVD processes. This is unquestionably true with respect to deposition of the cladding layer (*id.*, Col. 9, ll. 37 – 39), and is also true with respect to the core, notwithstanding the description of a hollow cathode chamber arrangement providing a "high plasma density" (*id.*, Col. 54 – 60). Claim 1 has incorporated the definition of a "high-density plasma" provided in the specification as exceeding 10^{11} ions/cm^3 and clarified that it is generated inductively. Inductive plasma generation is used to achieve such a high plasma density, and it is this density that results in the simultaneous deposition and sputtering components. This high a density is not achieved when plasmas are generated capacitively, such as described in Bazylenko with its description of "two opposing rf powered ... electrodes for producing a high density plasma between them due to an 'electron mirror' effect") (*id.*, Col. 2, ll. 57 – 60). Since Bazylenko describes only capacitively coupled plasma generation, there is no reason to believe that it achieves a plasma density as high as 10^{11} ions/cm^3 and provides simultaneous deposition and sputtering components as required.

Furthermore, the fact that Bazylenko fails to teach a process with this characteristic means that there is no reasonable expectation that its process could accommodate gapfill with the physical gap structures recited in the claims. Gapfill is a complex problem and processes that treat gapfill applications are intimately dependent on the physical structure of the gaps. Because Bazylenko does not teach a deposition method well suited for the required gapfill applications, there is no motivation to modify it by adding additional structures that produce such gaps. Applicant is not relying on duplication of structures for patentability, but is instead noting that the claimed method treats a physical structure that is not contemplated by, and not well suited for treatment by, the method of Bazylenko. The mere teaching of multiple optical cores in other references does not provide a sufficient basis for modifying Bazylenko in the manner proposed. It is respectfully believed that the Office Action is improperly using Applicant's disclosure to engage in hindsight reconstruction of the invention:

> It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."
> *In re Fritch*, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992), *quoting In re Fine*, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988).

Applicant also disagrees with the Office Action's characterization of Dragone. Dragone describes a multiplexing apparatus that uses star couplers. It does not disclose cores that get closer and closer until they meet. For example, in Fig. 1 of Dragone, waveguides in arrays 16 and 20 remain separated by distances t and t' at the star-coupler boundaries (Dragone, Col. 2, ll. 50 – 66). Applicant accordingly disagrees with the assertion in the Office Action that "it would be reasonable to expect that at some location before they meet, that the gap is 1 – 2 microns wide." There is no specific indication of a teaching of gaps within the claimed range, and certainly not of a separation of *cores* within that range.

Each of Shieh, Van Cleemput, and Roche is drawn from the semiconductor-fabrication arts and is concerned with gapfill applications in an entirely different physical realm from that required by the claims. Only Zhong is drawn from the optical-waveguide arts and, as noted above, it does not teach the specific combination of parameters that results in criticality by avoiding the need to anneal the deposited uppercladding layer while achieving the desired refractive index by scavenging hydrogen from silane precursors. It is respectfully believed that the inquiry of whether it would be a matter of routine experimentation to optimize the

deposition/sputter ratio should never be reached since it is not otherwise established that the claims are "encompassed by the prior art" (MPEP 2144.05). Nevertheless, even if the inquiry is reached, the claims are still believed to be patentable as a consequence of the criticality of the combination.

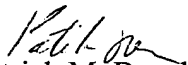
For the above reasons, independent Claim 1 is believed to be patentable and each of the dependent claims is believed to be patentable by virtue of its dependence from a patentable claim.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 303-571-4000.

Respectfully submitted,



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